IN THE SPECIFICATION

Amendments to the Specification:

Please replace the paragraph beginning at line 10 of page 8 of the Application as filed with the following rewritten paragraph:

As illustrated in Figures 2 and 3, embodiments of the present invention utilize MTJ devices having a perpendicular magnetic orientation, the magnetic orientation being perpendicular to bitlines 202 and wordlines 204, which results in the MRAM having high magnetic stability in the ultra-small device area. Advantageously, embodiments of the present invention address the superparamagnetic-ferromagnetic transition point issue occurring in conventional MRAM designs. That is, the superparamagnetic-ferromagnetic transition point issue no longer occurs in the ultra-small device area when utilizing the present invention because of the perpendicular shape anisotropic energy control. As a result, the size limitation of ferromagnetic phase in the embodiments of the present invention depends on the fundamental exchange coupling length that is around nm.

Please replace the paragraph beginning on page 11, line 1 with the following rewritten paragraph:

For example, if $N = 10^{-1}$ (aspect ratio ~ 2.5 for rod shape), $M_S = 1000$ G, and ~~m = 20~~ $\mu = 20$, then $H_d = 5$ Oe, which is much smaller than an Hc of around 50 Oe.

Please replace the paragraph beginning page 12, lien 14 with the following rewritten paragraph:

Figure 10 is a diagram showing exemplary properties of MRAM cells, in accordance with an embodiment of the present invention. Equation (2) describes the relations ~~of Figure 10~~ shown in Figure 10. Specifically, s is the center-to-center distance between cells, t is the center-to-center distance from the free layer to the bit-line, r is the center-to-center distance from the insulator to the pinned layer, d is the height of the pinned layer, I_x and I_y are

currents in the x and y directions and H is the magnetic field strength, as are standard. The Greek "chi" symbol χ is the permeability of the μ-metal and Oe is the standard unit of magnetic field strength, known as the Oersted.